Lucas Busta

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Highlights

- Flexible and dedicated hard worker with exceptional organizational skills and attention to detail.
- Collaborates with domestic and international research groups and individuals via excellent communication and interpersonal skills to successfully accomplish project goals on time.
- Able to carry out multiple projects simultaneously, enabling concomitant pursuits of existing projects, new collaborative works, exploratory experiments, and manuscript writing.
- Seven years research laboratory experience. Excellent skills in chemical analysis including data acquisition, processing, visualization, interpretation, and archival.
- Five years hands-on experience maintaining, repairing, and documenting instrumentation and lab equipment: GC-FID, GC-MS, LC-ESI-MS, and gas delivery systems.

Education

2016 **Ph.D. Chemistry**, University of British Columbia

2011 **B.S. Chemistry**(honors), University of Minnesota - Duluth

2011 **B.S. Biochemistry and Molecular Biology**(honors), University of Minnesota - Duluth

Teaching Experience

University of British Columbia **Vancouver, BC**
Graduate Teaching Assistant *2011–present*
Guided, motivated, and evaluated students in multiple chemistry courses, received excellent student and supervisor evaluations. Developed skills in guided inquiry teaching methodology.

- 1^{st} year chemistry tutoring center (5–10 students)
  - Responsible for tutoring students in fundamental chemical concepts.
- 3^{rd} year analytical chemistry laboratory (6–12 students)
  - Charged with communicating instrumental design, operation principles, and analytical methodology.
- 2^{nd} year organic chemistry laboratory (15 students)
  - In charge of guiding students through basic chemical reactions and work-ups.
- 3^{rd} year analytical chemistry lecture (90 students)
  - Responsible for leading in-class tutorials, discussions, and group activities. Administered and graded quizzes.

University of Minnesota - Duluth **Duluth, MN**
Undergraduate Teaching Assistant *2009–2011*
Learned to manage and instruct students in a teaching laboratory setting and collaborate with other teaching assistants to design and implement exam grading rubrics.

- 2^{nd} year analytical chemistry laboratory (30 students)
  - As an undergraduate, coached other undergraduate students in the development of basic analytical chemistry skills: quantitative determinations, spectrochemical analysis, and chromatography.

Technological Experience

LabVIEW: Advanced user *Custom data acquisition and processing*

LaTeX: Advanced user *Professional typesetting and report writing*

Mendeley: Advanced user — *Reference collection and management*

R: Advanced user — *Statistical computing and graphics*

D3 Javascript visualizations: Intermediate user — *Custom data visualization for complex datasets*

Unix, Git(hub): Intermediate user — *Task automation and version control*

Research Experience

University of British Columbia — **Vancouver, BC**

Graduate Researcher, Laboratory of Dr. Reinhard Jetter — *2011–present*

Used chemical techniques to determine the structure of new wax compounds and study the biosynthesis of plant cuticular waxes.

- Scientific achievements
  - Chemical synthesis of authentic standards for structure elucidation and enzyme assay
  - Extensive literature review and biosynthetic analysis of specialty plant surface lipids
  - Experience with GC-MS, LC-ESI-MS, ToF-SIMS, and NMR.
  - Detailed chemical analyses of hundreds of plant and algae lipid extracts
- Other achievements
  - Developed custom data analysis software to increase throughput allowing extensive collaboration with domestic and foreign research groups.
  - Improved and documented laboratory instrument and equipment maintenance routines.
  - Maintained and repaired chromatography and MS equipment.
  - Constructed and maintained literature and measurement databases.

University of Minnesota - Duluth — **Duluth, MN**

Undergraduate Researcher, Laboratory of Dr. John Evans — *2008–2011*

Design and construction of an automated ice-sensing system for bridge decks.

- Scientific achievements
  - Developed and implemented custom data acquisition and processing software to sense the formation of ice on a time-domain reflectometry sensor.
  - Drafted custom software for spectrophotometric data acquisition and processing.
- Other achievements
  - Documented the structure and functionality of developed software in written reports.

Conference Presentations

2016 **Busta, L.**, Jetter, R.: Structure and biosynthesis of branched compounds from cuticular wax of *Arabidopsis thaliana*, Oral Presentation, Phytochemical Society of North America, Davis, CA

2015 **Busta, L.**, Budke, J., Jetter, R.: Cuticular waxes from the leafy gametophyte, sporophyte, and calyptra of the moss *Funaria hygrometrica*, Oral Presentation, BSA 2015, Edmonton, AB

2013 **Busta, L.**, Budke, J., Jetter, R.: Hydroxy esters from the gametophyte, sporophyte, and calyptra of the moss *Funaria hygrometrica*, Oral Presentation, Phytochemical Society of North America, Corvallis, OR

2011 **Busta, L.** et al: Development of a Time Domain Reflectometry System for the Determination of Ice Formation on Road and Bridge Surfaces, Oral Presentation, Spring Undergraduate Research Symposium, University of Minnesota Duluth, Duluth, MN

Invited Presentations

2016 **Busta, L.** The diversity and biosynthesis of cuticular waxes. The Boyce Thompson Institute, Ithaca, NY. (Special seminar)

2016 **Busta, L.** The diversity and biosynthesis of cuticular waxes. The Center for Plant Science Innovation, Lincoln, NE. (Special seminar)

2016 **Busta, L.** "Things I wish I'd known before starting graduate research". UBC Chemistry 319: Practical skills for chemical research, Vancouver, BC (Special lecture)

Publications

2017 Ulrike Bauer*, **Lucas Busta***, Reinhard Jetter. Nepenthes, *in prep*

2017 Yulin*, **Lucas Busta***, Reinhard Jetter. PKS

2017 Olga*, **Lucas Busta***, Reinhard Jetter. Cork Holm oak

2017 Tanjun*, **Lucas Busta**, Reinhard Jetter. Cork Holm oak

2017 **Lucas Busta**, Reinhard Jetter. Methyl alkyl resorcinols from wheat

2016 **Lucas Busta**, Reinhard Jetter. The structure and biosynthesis of branched wax compounds in *Arabidopsis thaliana*, *in prep*

2016 **Lucas Busta**, Reinhard Jetter. The structural diversity and biosynthesis of specialty plant wax compounds, *in prep*

2016 **Lucas Busta***, Daniela Hegebarth*, Reinhard Jetter. Changes in cuticular wax coverage and composition on developing Arabidopsis leaves are influenced by wax biosynthesis gene expression levels and trichome density, *in prep*

2016 Ok Tae Kim, Yurry Um, Mei Lan Jin, Young Chang Kim, Kyong Hwan Bang, Daniela Hegebarth, **Lucas Busta**, Radu Racovita, Reinhard Jetter. Transcriptomic Analysis of Methyl Jasmonate-Elicited *Centella asiatica* Leaves and Characterization of Multifunctional C-23 and C-28 Oxidases Involved in Centelloside Biosynthesis, *submitted*

2016 Pingtao Ding*, Dmitrij Rekhter*, Yuli Ding*, Kirstin Feussner, **Lucas Busta**, Sven Haroth, Shaohua Xu, Xin Li, Reinhard Jetter, Ivo Feussner, Yuelin Zhang. Systemic Acquired Resistance Deficient 4 encodes a key enzyme for pipecolic acid biosynthesis, *submitted*

2016 **Lucas Busta**, Jessica M. Budke†, Reinhard Jetter. Cuticular wax coverage on *Funaria hygrometrica* is similar to vascular plants, but wax composition differs between surfaces of the leafy gametophyte, calyptra, and sporophyte capsule, *Annals of Botany*, *in print*

2016 **Lucas Busta**, Jessica M. Budke†, Reinhard Jetter. Identification of β-hydroxy fatty acid esters and primary, secondary-alkanediol esters in cuticular waxes of the moss *Funaria hygrometrica*, *Phytochemistry*, Volume 121, Pages 38-49

Awards (Total $750)

2015 **Graduate Student Travel Award**: University of British Columbia ($500)

2013 **Best Oral Presentation Award**: Phytochemical Society of North America ($250)

2011 **Casmir Ilenda Award for Outstanding Undergraduate Research**: Univ. MN - Duluth

2011 **F.B. Moore Academic and Leadership Award**: Univ. MN - Duluth

2010 **American Chemical Society Undergraduate Analytical Chemist of the Year**: ACS

*co-first authors

†Collaborator in the analysis of moss cuticles, University Tennessee - Knoxville, 2014-present

2010 **Maguire Award for most promising chemistry student**: Univ. MN - Duluth

2009 **Maguire Award for most promising chemistry student**: Univ. MN - Duluth

References

Research

- Dr. Reinhard Jetter, Professor
  - Biological Sciences Building
    6270 University Boulevard
    Vancouver, BC Canada V6T 1Z4
  - 604 822 2477
  - reinhard.jetter@botany.ubc.ca

- Dr. John F. Evans, Professor
  - UMD Chemistry
    227 Chem
    1039 University Dr
    Duluth, MN 55812
  - 218 726 7232
  - jevans1@d.umn.edu

- Additional references available upon request

Teaching

- Dr. Robin Stoodley, Senior Instructor
  - Department of Chemistry
    2036 Main Mall
    Vancouver, BC Canada V6T 1Z1
  - 604 827 5829
  - stoodley@chem.ubc.ca

- Dr. Dan Bizzotto, Professor
  - Department of Chemistry
    2036 Main Mall
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  - bizzotto@chem.ubc.ca